

In the claims:

Please cancel claims 1 – 16, 27 – 31, and 46 – 55.

Claims 1 – 16 (Cancelled).

17. (Original) A method to determine the amount of stratified flow through a conduit, comprising:

(a) transmitting through a first portion of said conduit a first ultrasonic signal from a first upstream location;

(b) receiving said first ultrasonic signal at a location downstream of said first upstream location;

(c) transmitting through said first portion a second ultrasonic signal from a first downstream location;

(d) receiving said second ultrasonic signal at a location upstream of said first downstream location;

(e) transmitting through said first portion of said conduit a third ultrasonic signal from a second upstream location, said third ultrasonic signal reflecting of a surface of said stratified flow;

(f) receiving said third ultrasonic signal at a location downstream of said second upstream location;

(g) transmitting through said first portion a fourth ultrasonic signal from a second downstream location, said fourth ultrasonic signal reflecting of said surface of said stratified flow;

(h) receiving said fourth ultrasonic signal at a location upstream of said second downstream location;

(i) computing the amount of said stratified flow in said conduit based on the travel times of said first, second, third, and fourth ultrasonic signals.

18. (Original) The method of claim 17, wherein said first portion is not said stratified flow.

19. (Original) The method of claim 17, wherein said first portion is a gas.

20. The method of claim 17, wherein said first and second ultrasonic signals travel in a generally horizontal direction.

21. (Original) The method of claim 20, wherein said first and second ultrasonic signals are used to measure a speed of sound for a portion of said conduit not carrying said stratified flow.

22. (Original) The method of claim 17, wherein said first and second ultrasonic signals travel in generally horizontal directions and said third and fourth ultrasonic signals travel in generally vertical directions.

23. (Original) The method of claim 22, wherein said first and second ultrasonic signals are used to measure a speed of sound for a portion of said conduit not carrying said stratified flow and said third and fourth ultrasonic signals are used to measure a second speed of sound corresponding to a level of said stratified flow in said conduit.

24. (Original) The method of claim 17, wherein said first ultrasonic signal is transmitted by a first transducer and received by a second transducer, said second ultrasonic signal is transmitted by said second transducer and received by said first transducer, said third ultrasonic signal is transmitted by a third transducer and received by a fourth transducer, and said fourth ultrasonic signal is transmitted by said fourth transducer and received by said third transducer.

25. (Original) The method of claim 17, wherein said step of computing includes calculating a first measured speed of sound from said first and second ultrasonic signals, and a second measured speed of sound based on said third and fourth ultrasonic signals, the discrepancy between said first and second measured speeds of sound indicating the level of said stratified flow.

26. (Original) The method of claim 17, wherein said method is performed by a two-chord ultrasonic meter.

Claims 27 – 31 (Cancelled).

32. (Original) A method to determine the amount of stratified flow through a conduit, comprising:

(a) transmitting through a first portion of said conduit a first ultrasonic signal from a first upstream location;

(b) receiving said first ultrasonic signal at a location downstream of said first upstream location;

(c) transmitting through said first portion a second ultrasonic signal from a first downstream location;

(d) receiving said second ultrasonic signal at a location upstream of said first downstream location;

(e) transmitting through said first portion of said conduit a third ultrasonic signal from a second upstream location, said third ultrasonic signal reflecting of a surface of said stratified flow;

(f) receiving said third ultrasonic signal at a location downstream of said second upstream location;

(g) transmitting through said first portion a fourth ultrasonic signal from a second downstream location, said fourth ultrasonic signal reflecting of said surface of said stratified flow;

(h) receiving said fourth ultrasonic signal at a location upstream of said second downstream location;

(g) computing the amount of said stratified flow in said conduit based on the travel times of said first, second, third, and fourth ultrasonic signals.

33. (Original) The method of claim 32, wherein said first portion is not said stratified flow.

34. (Original) The method of claim 32, wherein said first portion is a gas.

35. (Original) The method of claim 32, wherein said first and second ultrasonic signals travel in a generally horizontal direction.

36. (Original) The method of claim 35, wherein said first and second ultrasonic signals are used to measure a speed of sound for a portion of said conduit not carrying said stratified flow.

37. (Original) The method of claim 32, wherein said first and second ultrasonic signals travel in generally horizontal directions and said third and fourth ultrasonic signals travel in generally vertical directions.

38. (Original) The method of claim 37, wherein said first and second ultrasonic signals are used to measure a speed of sound for a portion of said conduit not carrying said stratified flow and said third and fourth ultrasonic signals are used to measure a second speed of sound corresponding to a level of said stratified flow in said conduit.

39. (Original) The method of claim 32, wherein said first ultrasonic signal is transmitted by a first transducer and received by a second transducer, said second ultrasonic signal is transmitted by said second transducer and received by said first transducer, said third ultrasonic signal is transmitted by a third transducer and received by a fourth transducer, and said fourth ultrasonic signal is transmitted by said fourth transducer and received by said third transducer.

40. (Original) The method of claim 32, wherein said step of computing includes calculating a first measured speed of sound from said first and second ultrasonic signals, and a second measured speed of sound based on said third and fourth ultrasonic signals, the discrepancy between said first and second measured speeds of sound indicating the level of said stratified flow.

41. (Original) The method of claim 32, wherein said step of computing said amount of said stratified flow includes calculating the level of said stratified flow in said conduit.

42. (Original) The method of claim 32, wherein said step of computing said degree of stratified flow includes determination of the amount of said stratified flow by computing a speed for said stratified flow.

43. (Original) The method of claim 42, wherein said speed for said stratified flow is computed from the equation

$$V_L = \frac{V_G}{1 + \sqrt{\frac{\rho_L}{\rho_G}}}$$

ρ_L =density of the liquid

ρ_G = density of the gas

V_L = velocity of liquid

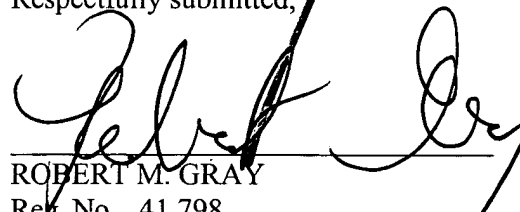
V_G = velocity of gas.

44. (Original) The method of claim 32, wherein said step of computing includes computing the quantity of stratified flow through the conduit by multiplying a velocity for said stratified flow by a cross-sectional area of said stratified flow.

45. (Original) The method of claim 32, wherein said degree is the depth of said stratified liquid flow.

Claims 46 – 55 (Cancelled).

Respectfully submitted,



ROBERT M. GRAY

Reg. No. 41,798

Conley Rose, P.C.

P. O. Box 3267

Houston, Texas 77253-3267

(713) 238-8000

ATTORNEY FOR APPLICANT